

RECEIVED
CENTRAL FAX CENTER

MAY 07 2007

AMENDMENTS TO THE CLAIMS

For the Examiner's convenience, all pending claims are set forth below and have been amended where noted:

- 1) (currently amended) An apparatus to traverse a seabed topographic feature, comprising:
a subsea pipeline constructed to carry fluids from a first location across the topographic feature to a second location; wherein:

the topographic feature is selected from the group consisting of subsea basins, domes, valleys, cliffs, canyons, escarpments and combinations thereof;

said pipeline comprising including at least one distributed buoyancy region having two or more buoyancy solutions disposed thereon;

said pipeline comprising a first unbuoyed pipeline section extending from said first location on a sea floor to said distributed buoyancy region and a second unbuoyed pipeline section extending from said distributed buoyancy region to said second location on a sea floor; and

said distributed buoyancy region connecting said first and said second pipeline sections in fluid communication.
- 2) (cancelled)
- 3) (currently amended) The apparatus of claim 1 wherein the buoyancy solution comprises ~~said distributed buoyancy region comprises a plurality of~~ one or more discrete buoyancy-providing modules ~~distributed~~ disposed along a length of said pipeline.
- 4) (currently amended) The apparatus of claim 1 wherein the buoyancy solution comprises ~~said distributed buoyancy region comprises~~ a continuous coating of buoyant material.
- 5) (original) The apparatus of claim 1 further including a tether system to retain said pipeline in position and to resist forces of undersea currents.

- 6) (original) The apparatus of claim 1 wherein said first and said second pipeline sections are negatively buoyant.
- 7) (cancelled)
- 8) (original) The apparatus of claim 1 further including a first flexure control device at said first location to reduce bending stress and strain in said first pipeline section.
- 9) (original) The apparatus of claim 8 wherein said first flexure control device is located proximate to a cliff edge of the topographic feature.
- 10) (original) The apparatus of claim 9 wherein said first flexure control device includes a flex joint.
- 11) (original) The apparatus of claim 9 wherein said first flexure control device includes a stress joint.
- 12) (original) The apparatus of claim 9 wherein said first flexure control device includes a swivel.
- 13) (original) The apparatus of claim 9 wherein said first flexure control device includes an anchor.
- 14) (original) The apparatus of claim 9 wherein said first flexure control device is located between said first pipeline section and said distributed buoyancy region.
- 15) (cancelled)
- 16) (original) The apparatus of claim 14 wherein said distributed buoyancy region is positively buoyant.
- 17) (original) The apparatus of claim 9 wherein said first pipeline section is located between said first flexure control device and said distributed buoyancy region.
- 18) (original) The apparatus of claim 17 wherein said first pipeline section is taut and is positioned above said first flexure control device.

Response to Office Action dated 03-21-2007
Serial Number: 10/711,487

- 19) (original) The apparatus of claim 18 wherein said second pipeline section is negatively buoyant.
- 20) (original) The apparatus of claim 9 wherein said second pipeline section extends from said distributed buoyancy region to a second flexure control device located at said second location and configured to reduce bending stress and strain in said second pipeline section.
- 21) (original) The apparatus of claim 20 wherein said first flexure control device is located between said first pipeline section and said distributed buoyancy region.
- 22) (original) The apparatus of claim 21 wherein said second pipeline section is taut and is positioned above said second flexure control device.
- 23) (original) The apparatus of claim 20 wherein said first pipeline section is located between said first flexure control device and said distributed buoyancy region.
- 24) (original) The apparatus of claim 23 wherein said first pipeline section is taut and positioned above said first flexure control device, and said second pipeline section is taut and positioned above said second flexure control device.
- 25) (previously presented) The apparatus of claim 8 wherein said first flexure control device is located distant to a cliff edge of the topographic feature.
- 26) (original) The apparatus of claim 25 wherein said first flexure control device is located between said first pipeline section and said distributed buoyancy region.
- 27) (original) The apparatus of claim 26 wherein said distributed buoyancy region is positively buoyant.
- 28) (original) The apparatus of claim 25 wherein said first pipeline section is located between said first flexure control device and said distributed buoyancy region.
- 29) (original) The apparatus of claim 28 wherein said first pipeline section is taut and positioned above said first flexure control device.

- 30) (original) The apparatus of claim 28 wherein said second pipeline section is negatively buoyant.
- 31) (original) The apparatus of claim 28 wherein said second pipeline section extends from said distributed buoyancy region to a second flexure control device located at said second location to reduce bending stress and strain in said second pipeline section.
- 32) (original) The apparatus of claim 31 wherein said first pipeline section is taut and positioned above said first flexure control device and said second pipeline section is taut and positioned above said second flexure control device.
- 33) (original) The apparatus of claim 1 further including a flexure control device at said second location to reduce bending stress and strain in said second pipeline section.
- 34) (original) The apparatus of claim 33 wherein said second pipeline section is taut.
- 35) (cancelled)
- 36) (cancelled)
- 37) (cancelled)
- 38) (cancelled)
- 39) (cancelled)
- 40) (cancelled)
- 41) (cancelled)
- 42) (cancelled)
- 43) (cancelled)
- 44) (cancelled)
- 45) (cancelled)

46) (cancelled)

47) (cancelled)

48) (cancelled)

49) (cancelled)

50) (currently amended) An apparatus to traverse a seabed topographic feature, comprising:
a subsea pipeline constructed to carry fluids from a first location across the topographic
feature to a second location; wherein;

the topographic feature is selected from the group consisting of subsea basins, domes,
valleys, cliffs, canyons, escarpments and combinations thereof;

said pipeline comprising ~~including~~ at least one distributed buoyancy region;

said pipeline comprising a first unbuoyed pipeline section extending from said first
location on a sea floor to said distributed buoyancy region and a second unbuoyed
pipeline section extending from said distributed buoyancy region to said second
location on a sea floor; and

said distributed buoyancy region comprising two or more buoyancy solutions disposed
thereon and a flexible positively buoyant inverse catenary section connecting said
first and said second pipeline sections in fluid communication ~~wherein said
distributed buoyancy device region comprises a flexible positively buoyant
inverse catenary section.~~

51) (previously presented) The apparatus of claim 50 wherein said distributed buoyancy
device region is unanchored and freely suspended.

52) (currently amended) The apparatus of claim ~~20~~ 50 wherein said second flexure control
device is located proximate to a second cliff edge of the topographic feature.

53) (currently amended) The apparatus of claim ~~20~~ 50 wherein said second flexure control

device is located distant to a second cliff edge of the topographic feature.

- 54) (currently amended) The apparatus of claim ~~20~~ 50 wherein said second flexure control device includes a flex joint.
- 55) (currently amended) The apparatus of claim ~~20~~ 50 wherein said second flexure control device includes a stress joint.
- 56) (currently amended) The apparatus of claim ~~20~~ 50 wherein said second flexure control device includes a swivel.
- 57) (currently amended) The apparatus of claim ~~20~~ 50 wherein said second flexure control device includes an anchor.
- 58) (currently amended) An apparatus to traverse a seabed topographic feature, comprising:

a subsea pipeline constructed to carry fluids from a first location across the topographic feature to a second location; wherein:

the topographic feature is selected from the group consisting of subsea basins, domes, valleys, cliffs, canyons, escarpments and combinations thereof;

said pipeline comprising ~~including~~ at least one distributed buoyancy region;

said pipeline comprising a first unbuoyed pipeline section extending from said first location on a sea floor to said distributed buoyancy region and a second unbuoyed pipeline section extending from said distributed buoyancy region to said second location on a sea floor; and

said distributed buoyancy region comprising two or more buoyancy solutions disposed thereon and a flexible positively buoyant inverse catenary section connecting said first and said second pipeline sections in fluid communication; and

a first flexure control device at said first location to reduce bending stress and strain in

said first unbuoyed pipeline section said distributed buoyancy region connecting said first and said second pipeline sections in fluid communication.

- 59) (currently amended) The apparatus of claim 58 wherein the buoyancy solution comprises ~~said distributed buoyancy region comprises a plurality of one or more~~ buoyancy-providing modules ~~distributed~~ disposed along a length of said pipeline.
- 60) (currently amended) The apparatus of claim 58 wherein the buoyancy solution comprises ~~said distributed buoyancy region comprises~~ a continuous coating of buoyant material.
- 61) (previously presented) The apparatus of claim 58 further including a tether system to retain said pipeline in position and to resist forces of undersea currents.
- 62) (previously presented) The apparatus of claim 58 wherein said first and said second pipeline sections are negatively buoyant.
- 63) (cancelled)
- 64) (previously presented) The apparatus of claim 58 wherein said first flexure control device is located proximate to a cliff edge of the topographic feature.
- 65) (previously presented) The apparatus of claim 58 wherein said first flexure control device is located distant to a cliff edge of the topographic feature.
- 66) (new) A pipeline for traversing a topographic seabed, comprising:

a first unbuoyed section located subsea;

a second unbuoyed section located subsea; and

at least one buoyancy section disposed between the first and second unbuoyed sections, the buoyancy section comprising two or more spatially arranged buoyancy solutions disposed about an outer diameter thereof, wherein the first and second unbuoyed sections are in fluid communication with one another via the buoyancy section.

- 67) (new) The pipeline of claim 66, wherein the buoyancy solution comprises two or more discrete buoyancy-providing modules.
- 68) (new) The pipeline of claim 67, wherein the buoyancy-providing module is a buoy.
- 69) (new) The pipeline of claim 67, wherein the buoyancy-providing module is a tethered buoy.
- 70) (new) The pipeline of claim 67, wherein the buoyancy-providing module is a buoyant coating.
- 71) (new) The pipeline of claim 66, wherein the topographic seabed comprises one or more subsea basins, domes, valleys, cliffs, canyons, escarpments, or combinations thereof.
- 72) (new) The pipeline of claim 67, wherein the discrete buoyancy-providing module is a buoyant coating, buoy, or combination thereof.

Applicant believes that no new matter has been added with these amendments.